GEORGIA INSTITUTE OF TECHNOLOGY — OFFICE OF CONTRACT ADMINISTRATION

PROJECT ADMINISTRATION DATA SHEET

[X] ORIGINAL [ ] REVISION NO. _____

Project No. E-19-A06 (R6059-0A4) GTRC/~~GXK~~ DATE 10 /24 /85

Project Director: Dr. Jeffrey Hsieh School/~~Lab~~ XXX Chemical Engr.

Sponsor: Georgia Power Company

Type Agreement: Letter of Acceptance Task EP1 under BOA 95

Award Period: From 9/18/85 To ~~6-30-86~~ ~~12/31/85~~ 7/30/87 (Performance) ~~6-30-86~~ ~~12/31/85~~ (Reports)

Sponsor Amount:	This Change	Total to Date
Estimated:	$ 13,589	$ 13,589
Funded:	$ 13,589	$ 13,589

Cost Sharing Amount: $ None Cost Sharing No: N/A

Title: Pilot Plant Study of Pulp Flow and Refining

ADMINISTRATIVE DATA OCA Contact R. Dennis Farmer X4820

1) Sponsor Technical Contact:

Gary L. Birdwell
Georgia Power Company
333 Piedmont Avenue, NE (20th Floor)
Atlanta, Georgia 30308
526-7359

2) Sponsor Admin/Contractual Matters:

Same as 1)

Defense Priority Rating: N/A Military Security Classification: N/A

(or) Company/Industrial Proprietary: See Below

RESTRICTIONS

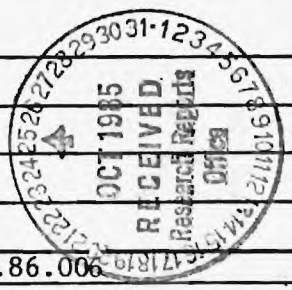
See Attached N/A Supplemental Information Sheet for Additional Requirements.

Travel: Foreign travel must have prior approval – Contact OCA in each case. Domestic travel requires sponsor approval where total will exceed greater of $500 or 125% of approved proposal budget category.

Equipment: Title vests with Sponsor

COMMENTS:

A Non-Disclosure Agreement has been negotiated.



COPIES TO: SPONSOR'S I. D. NO. 02.256.000.86.006

Project Director	Procurement/GTRI Supply Services	GTRC
Research Administrative Network	Research Security Services	Library
Research Property Management	Reports Coordinator (OCA)	Project File
Accounting	Research Communications (2)	Other A. Jones

GEORGIA INSTITUTE OF TECHNOLOGY OFFICE OF CONTRACT ADMINISTRATION

SPONSORED PROJECT TERMINATION/CLOSEOUT SHEET

Date 4/27/88

Project No. E-19-A06 School/~~XXX~~ ChE

Includes Subproject No.(s) N/A

Project Director(s) Dr. Jeffrey Hsieh GTRC/~~GXX~~

Sponsor Georgia Power Company

Title Pilot Plant Study of Pulp Flow and Refining

Effective Completion Date: 7/30/87 (Performance) 7/30/87 (Reports)

Grant/Contract Closeout Actions Remaining:

- [ ] None
- [X] Final Invoice or Copy of Last Invoice Serving as Final
- [ ] Release and Assignment
- [X] Final Report of Inventions and/or Subcontract:
  Patent and Subcontract Questionnaire sent to Project Director [X]
- [ ] Govt. Property Inventory & Related Certificate
- [ ] Classified Material Certificate
- [ ] Other

Continues Project No. Continued by Project No.

COPIES TO:

Project Director
Research Administrative Network
Research Property Management
Accounting
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GTRC
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Other

GEORGIA POWER COMPANY GENERAL PURCHASING AGREEMENT

TECHNOLOGY DEVELOPMENT CENTER TASK STATEMENT - BOA 95 - TASK EP1

PROJECT NAME: Pilot Plant Study of Pulp Flow and Refining

PRINCIPAL INVESTIGATOR: Jeffrey Hsieh, Chemical Engineering

FINAL STATUS REPORT: Fall Quarter 1985

The following items were accomplished:

- A preliminary design and specification of a pilot plant prototype was completed.
- Models were written for fiber refining and felt vacuum with adjustable speed drive through the development of two preliminary FORTRAN computer programs. Further refinement of the said programs is needed to define the benefits of above two applications in fiber processing.
- Additional opportunities in the pulp and papermaking processes related to energy utilization were identified. Further efforts are needed to quantify some items. A very preliminary matrix of technology versus processes will be presented in a qualitative way for initial discussion.
- Interactions with faculty members and graduate students in Electrical Engineering were initiated.
- The following mill visits were made to establish a dialogue with the pulp and paper plants to better determine potential areas of research and applications:
  - Augusta Newsprint Company, Augusta, Georgia
  - Owens-Illinois Plant, Valdosta, Georgia
  - Georgia Kraft Mill, Rome, Georgia.

TECHNOLOGY DEVELOPMENT CENTER

TASK EP1

Quality and Productivity Improvement in Pulp and Papermaking Processes

by

Jeffery S. HSIEH

School of Chemical Engineering
Georgia Institute of Technology
Atlanta, Georgia 30332-0100

- Progress has been made in the development of Technology-Processes matrix which include existing, developing and new technology. The processes involve semichemical pulping, wood preparation, refining, stock preparation, approach flow system, sheet formation, pressing, drying, mixing and bleaching.

- A flow chart of above Technology-Processes matrix was developed for easy reference.

- On selected emerging technology, special 'Technology Brief' were prepared for the awareness which include process description, applications, process advantages/ disadvantages, benefits to industry, existing/competitive processes, potential customers and equipments manufacturers.

- To assist Atif Debs(E.E.) and David Goldfarb(Georgia Power) in their effort of linear-algebra model development for the prediction of productivity growth through electricity for the pulp and paper industry in Georgia.

- To use MAPPS (Modular Analysis of Pulp and Paper System) in analyzing a paper drying system consisting of the hood, web, blowers and steam drums.

- Interacted with Georgia Tech's Pulp and Paper Industrial Advisory Board in presentations, connections and resources.

- Visited many mills in Georgia to observe their needs and interests related to existing, developing and new process technology.

- Reinforced the development of paper drying laboratory by adding a paid working student and two seniors in taking drying research course work to help the involved graduate student.

- To support the drying technology development

(A) A complete laboratory papermaking equipment is set-up and calibrated for experiments. The items are:

(i) Fiber stock preparation system

(ii) Sheet forming mould

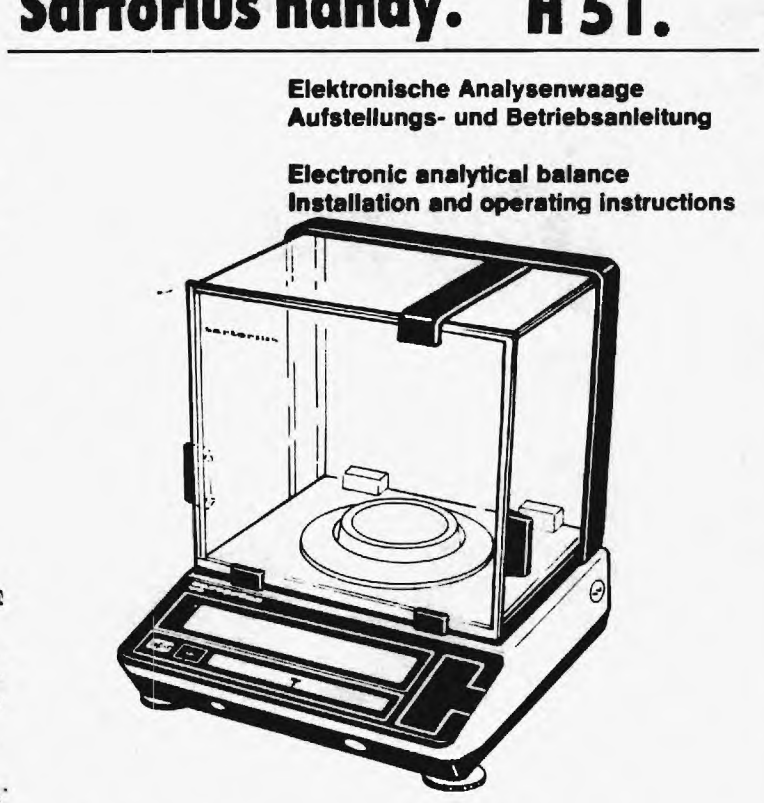
(iii) Controlled roll press with felts

(iv) Steam heated cylinder dryer with variable rotation speed

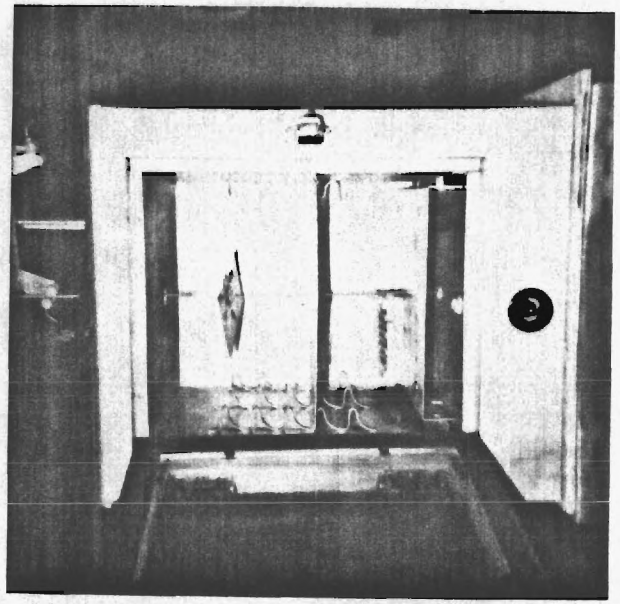
The above equipments are used to simulate conventional papermaking drying process and to provide controlled pressed sheets for the evaluation of other drying processes.

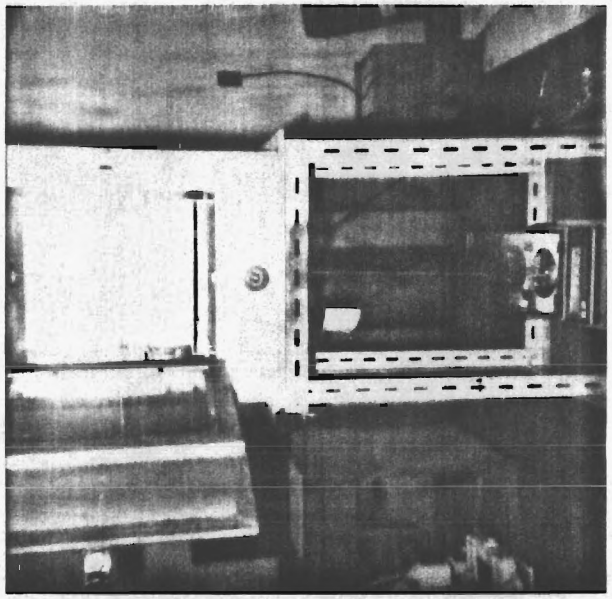
(B) To improve the accuracy of solid content evaluation, a system capable of monitoring the weight of paper drying has been designed. A SARTORIUS precision balance was purchased. The oven was modified to provide adequate heating power for required paper drying. To avoid moisture regain, a supporting structure was built to allow the oven sitting on the top of the balance.

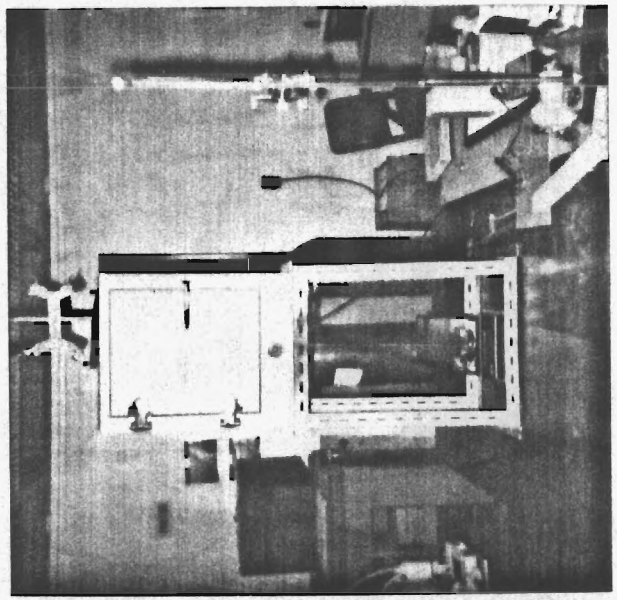
As shown in the picture on the next page, an aluminum rod having a metal plate at both ends are fabricated to permit the weight measurement. This design will provide a reliable tool for monitoring the the entire drying profile.

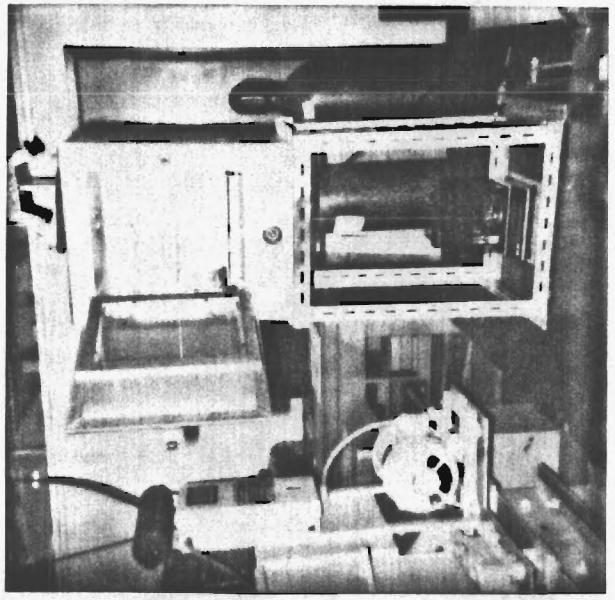


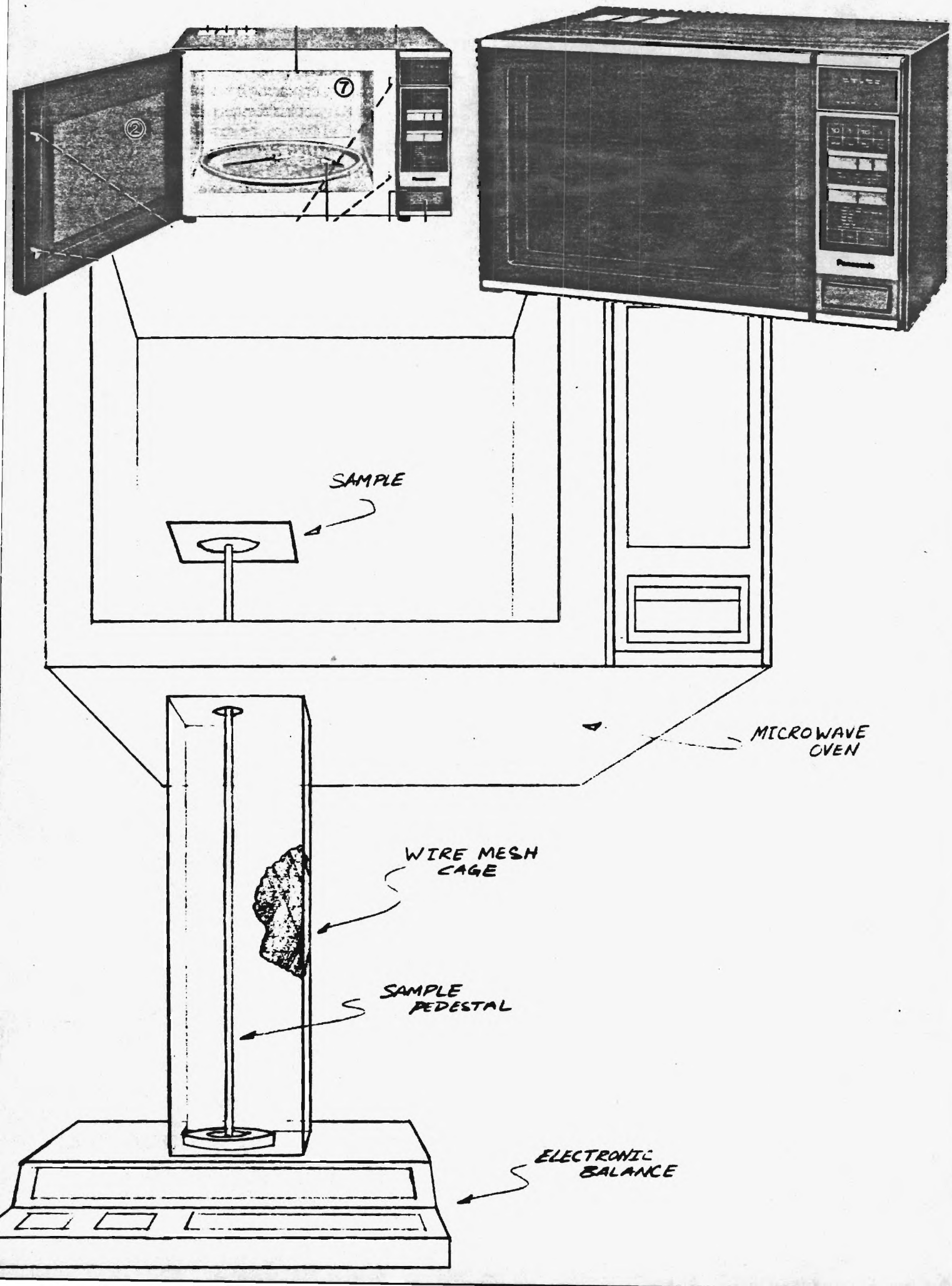
(C) A 700 watts PANASONIC microwave oven (Model NE-7875) was also purchased. A similar design was used to allow the microwave oven to be placed on the top of the balance. Safety shield made of wire mesh cage was used to prevent leakage of weighing rod opening. Continuous microwave drying profile can be obtained through this set-up.










SAMPLE
MICROWAVE OVEN
WIRE MESH CAGE
SAMPLE PEDESTAL
ELECTRONIC BALANCE